

**BOBBY JINDAL**  
GOVERNOR



**HAROLD LEGGETT, Ph.D.**  
SECRETARY

**State of Louisiana**  
**DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**ENVIRONMENTAL SERVICES**

Certified Mail No.

Agency Interest (AI) No. 85652  
Activity No. PER20060004

Mr. Paul Soileau  
Responsible Official  
PO Box 150  
c/o Bldg 3502  
Plaquemine, LA 70765-0150

RE: Prevention of Significant Deterioration (PSD) Permit, PSD-LA-659(M-2)  
Plaquemine Cogeneration Plant  
Dow Chemical Co, Plaquemine, Iberville Parish, Louisiana

Dear Mr. Davis:

Enclosed is your permit, PSD-LA-659(M-2). Construction of the proposed project is not allowed until such time as the corresponding Part 70 Operating Permit is issued.

Should you have any questions, contact Dustin Duhon of the Air Permits Division at (225) 219-3057.

Sincerely,

Cheryl Sonnier Nolan  
Assistant Secretary

\_\_\_\_\_  
Date

CSN:dcd

c: US EPA Region VI

**Agency Interest No. 85652  
PSD-LA-659(M-2)**

**AUTHORIZATION TO CONSTRUCT AND OPERATE AN EXISTING FACILITY  
PURSUANT TO THE PREVENTION OF SIGNIFICANT DETERIORATION  
REGULATIONS IN LOUISIANA ENVIRONMENTAL REGULATORY CODE,  
LAC 33:III.509**

In accordance with the provisions of the Louisiana Environmental Regulatory Code, LAC 33:III.509,

Dow Chemical Co.  
PO Box 150 Bldg 3502 E  
Plaquemine, LA 70765-0150

is authorized to operate the cogeneration power plant at the The Dow Chemical Co - Plaquemine  
Cogeneration Plant near

21255 Hwy 1  
Gate 1 within Dow Chemical Co.  
(a portion of)  
Plaquemine, LA 70764

subject to the emissions limitations, monitoring requirements, and other conditions set forth  
hereinafter.

This PSD modification to permit No. PSD-LA-659(M-1) does not authorize construction of any  
additional new or modified units.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 2008.

Cheryl Sonnier Nolan  
Assistant Secretary  
Office of Environmental Services  
Louisiana Department of Environmental Quality

## **BRIEFING SHEET**

**PLAQUEMINE COGENERATION PLANT**  
**AGENCY INTEREST NO.: 85652**  
**DOW CHEMICAL CO.**  
**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**  
**PSD-LA-659(M-2)**

### **PURPOSE**

The Dow Chemical Company's Plaquemine Cogeneration Plant, is an existing electric and steam utility cogeneration facility. American Electric Power's (AEP) Ventures Lease Co. was the former owner and operator before the facility recently changed ownership on November 30, 2006. The facility also became contiguous upon the change in ownership with The Dow Chemical Company's Louisiana Division, Agency Interest No. 1409. The Dow Chemical Company's Plaquemine Cogeneration Plant currently operates under Permit No. 1280-00096-V1, issued October 3, 2003 and administratively amended March 21, 2005 and June 13, 2006.

This permit modification incorporates start-up / shut-down emissions from the power plant into the permit. This permit modification also incorporates a specific limitation of the sulfur content of the natural gas fuel burned in the turbines.

### **RECOMMENDATION**

Approval of the proposed modification and issuance of a permit.

### **REVIEWING AGENCY**

Louisiana Department of Environmental Quality, Office of Environmental Services, Air Permits Division

### **PROJECT DESCRIPTION**

This permit modification, PSD-LA-659(M-2), incorporates start-up/shut-down emissions from the power plant into this PSD permit. Start-up operations are defined as the time the unit starts combusting fuel until the turbines reach normal operational mode. The gas valves open to the vent stack when the reference temperature on the combustion turbine reaches a set temperature. The Continuous Emission Monitor System (CEMS) has a signal for when the unit reaches the normal operational set temperature. Shut-down is the reverse of Start-up, when the unit transfers out normal operational mode until no more fuel is combusted. Because the The Dow Chemical Company's Plaquemine Cogeneration Plant uses natural gas to fuel the turbines, only Nitrogen Oxides (NO<sub>x</sub>), Carbon Monoxide (CO), and Volatile Organic Compounds (VOCs) are the pollutants of concern.

The Plaquemine Cogeneration Plant is comprised of four natural gas fired GE Frame 7 FA gas turbines, each with a nominal power rating of 170 MW. The turbines are equipped with dry low NO<sub>x</sub> combustors capable of achieving a NO<sub>x</sub> concentration of 9 parts per million on a dry volume basis, corrected to 15 percent oxygen (ppmvd @ 15% O<sub>2</sub>) during non-peaking operations. Each turbine is also equipped with steam injection capabilities to boost power for peaking purposes. Steam is not used by the facility as a method of NO<sub>x</sub> control.

## BRIEFING SHEET

### PLAQUEMINE COGENERATION PLANT AGENCY INTEREST NO.: 85652 DOW CHEMICAL CO. PLAQUEMINE, IBERVILLE PARISH, LOUISIANA PSD-LA-659(M-2)

Each gas turbine is equipped with a heat recovery steam generator (HRSG) and a supplementary-fired duct burner system. The duct burners are capable of firing pure natural gas, plant produced fuel gas provided by the host facility (composed of up to 60% hydrogen with a balance of methane), and/or a pure hydrogen stream provided by the host facility.

Each combined gas turbine/duct burner is outfitted with a selective catalytic reduction (SCR) system capable of achieving a  $\text{NO}_x$  concentration of 5 ppmvd @ 15%  $\text{O}_2$  on an annual average basis.

Due to mechanical considerations associated with firing pure hydrogen, each duct burner system is equipped with two sets of burners. One set will exclusively fire the pure hydrogen fuel stream, and the second will fire plant produced fuel gas, natural gas, or a blend of plant produced fuel gas and natural gas. The plant produced fuel gas and natural gas fuels will be fed to the duct burners in a common header system. Air augmentation of duct burners may be used during steam injection operating mode to insure stable combustion in the high moisture gas stream. Steam from the HRSGs is either supplied to the host or used to power a steam turbine generator. This generator has a nominal power rating of 200 MW.

A substantial technological limitation exists with respect to limiting start-up / shut-down emissions for combined cycle generating units. Start-up event duration is limited by the time required to adequately warm the heat recovery steam generator (HRSG), associated steam-handling systems and the steam turbine without imparting harmful thermal stresses to this equipment. As the combustion turbine begins operation, the exhaust gases which pass through the HRSG warm the water filled tubes, which begins the process of creating steam which drives the steam turbine.

Although the process of creating steam can begin relatively quickly, an abrupt introduction of steam to the steam turbine can result in uneven expansion of components. This uneven expansion of components can have severe adverse effects on its ability to operate, as well as creating a significant safety hazard. In general, the more time a combined cycle generating unit has been off-line, the more time is required to properly warm the steam cycle.

There are two types of start-up events depending on the length of time that the turbine is off-line between operational events. A cold start is associated with the turbine being off-line for a duration in which the turbine reaches ambient temperature, while a warm start occurs when a unit is down for less time than it takes the turbine to reach ambient temperatures.

Emission maximum lb/hr rate increases for  $\text{NO}_x$ , CO, and VOC are due to including the start-up/shut-down emissions of the four turbines, EQT006, Combustion Gas Turbine GT-500, EQT007, Combustion Gas Turbine GT-600, EQT008, Combustion Gas Turbine GT-700, and EQT009, Combustion Gas Turbine GT-800. These emissions have existed at the site since initial start-up. The emission increases are not due to the installation or modification of any new equipment at the site.

Because the HRSGs are not fired until the turbines reach normal operation, the annual start-up/shut-down emissions are included on GRP006, SU/SD Operation Turbine GT-500, GRP007, SU/SD Operation Turbine GT-600, GRP008, SU/SD Operation Turbine GT-700, and GRP009, SU/SD

## BRIEFING SHEET

### PLAQUEMINE COGENERATION PLANT AGENCY INTEREST NO.: 85652 DOW CHEMICAL CO. PLAQUEMINE, IBERVILLE PARISH, LOUISIANA PSD-LA-659(M-2)

Operation Turbine GT-800. Plaquemine Cogeneration Plant will demonstrate compliance with the permit limits for GRP005 through GRP009 by following the monitoring, recordkeeping, and calculation.

This permit also modifies the nitrogen oxides (NO<sub>x</sub>) limitation to allow the facility adequate time to make adjustments to the four turbines, EQT006, Combustion Gas Turbine GT-500, EQT007, Combustion Gas Turbine GT-600, EQT008, Combustion Gas Turbine GT-700, and EQT009, Combustion Gas Turbine GT-800 rather than have to shut them down to avoid an exceedance. As a result of these frequent shutdowns, Plaquemine Cogeneration Plant does not have enough CEMS data to justify a more appropriate NO<sub>x</sub> BACT limitation during normal operations. Therefore, the proposed permit allows a higher NO<sub>x</sub> BACT maximum pounds per hour limitation to allow for adequate time to make process adjustments to the equipment. In addition, the proposed permit requires Plaquemine Cogeneration Plant to collect continuous emissions data for a period of twelve (12) months and then submit a copy of the of the CEMS data to LDEQ. Upon review of the information submitted, LDEQ will make a determination regarding whether or not Plaquemine Cogeneration Plant must submit a permit modification application in order to incorporate this data into the permit. If a permit modification is determined to be appropriate, LDEQ will respond in writing indicating a deadline by which Plaquemine Cogeneration Plant shall be required to submit a permit modification application. The NO<sub>x</sub> BACT limit of 5 ppmvd @ 15% oxygen will not change as a result.

Ancillary equipment at the plant will include an 18-ton pressurized anhydrous ammonia storage vessel and a cooling tower that will primarily service the steam turbine generator. The Permits Division has reviewed BACT for the cooling tower and found that the combination of drift eliminators designed to achieve a drift rate of 0.005% and good operating practices remain appropriate.

Estimated emissions, in tons per year, are as follows:

<u>Pollutant</u>	<u>Before</u>	<u>After</u>	<u>Change</u>
PM <sub>10</sub>	559.40	559.40	-
SO <sub>2</sub>	214.80	214.80	-
NO <sub>x</sub>	854.40	854.40	-
CO	2503.20	2503.20	-
VOC	43.00	48.16	+ 5.16

**BRIEFING SHEET**

**PLAQUEMINE COGENERATION PLANT**  
**AGENCY INTEREST NO.: 85652**  
**DOW CHEMICAL CO.**  
**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**  
**PSD-LA-659(M-2)**

<u>Pollutant</u>	<u>Baseline Actual Emissions</u>	<u>Projected Actual Emissions/PTE</u>	<u>Contemporaneous Changes</u>	<u>Net Emissions Increase</u>	<u>PSD de minimis</u>	<u>Review required?</u>
PM	559.40	559.40	-	-	25	No
PM <sub>10</sub>	559.40	559.40	-	-	15	No
SO <sub>2</sub>	214.80	214.80	-	-	40	No
NO <sub>x</sub>	854.40	854.40	-	-	40	No
CO	2503.20	2503.20	-	-	100	No
VOC	43.00	48.16	-	5.16	40	No
Formaldehyde	5.80	5.80	-	-	-	No
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	2.00	2.00	-	-	7	No
Ammonia (NH <sub>3</sub> , as slip)	631.50	631.50	-	-	-	No

**TYPE OF REVIEW**

This PSD modification presents the review for Particulate Matter (PM<sub>10</sub>), Nitrogen Oxide (NO<sub>x</sub>; prior to December 21, 2001, the facility was subject to PSD review of NO<sub>x</sub>, however, the facility was not subject to Non-attainment New Source Review (NNSR) of NO<sub>x</sub>), Carbon Monoxide (CO), and Volatile Organic Compound (VOC) emissions from previous PSD modifications for the Plaquemine Cogeneration plant, in addition to a review for the start-up/shut-down emissions. In permits PSD-LA-659(M-1) and PSD-LA-659, PM<sub>10</sub>, NO<sub>x</sub>, and CO emissions exceeded the PSD significance levels. The review, in accordance with PSD regulations, performed in these permits is still applicable for the cooling towers, turbines, or duct burners. Emissions of LAC 33:III. Chapter 51-regulated toxic air pollutants (TAP) have been reviewed pursuant to the requirements of the Louisiana Air Quality Regulations.

**BEST AVAILABLE CONTROL TECHNOLOGY**

Best Available Control Technology (BACT) has been selected for the start-up/shut-down emissions included in this PSD modification. The selection of control technology was based on the BACT analysis using a "top down" approach and included consideration of control of toxic materials. There is no change in the BACT analysis specified in the previous PSD Permits No. PSD-LA-659(M-1), issued October 3, 2003, and PSD-LA-659 dated December 26, 2001, for the cooling towers, turbines, or duct burners.

## BRIEFING SHEET

### PLAQUEMINE COGENERATION PLANT AGENCY INTEREST NO.: 85652 DOW CHEMICAL CO. PLAQUEMINE, IBERVILLE PARISH, LOUISIANA PSD-LA-659(M-2)

**Alternate Operating Scenario: GT-500 - SU/SD Operation Turbine GT-500 (GRP010)**

**Alternate Operating Scenario: GT-600 - SU/SD Operation Turbine GT-600 (GRP011)**

**Alternate Operating Scenario: GT-700 - SU/SD Operation Turbine GT-700 (GRP012)**

**Alternate Operating Scenario: GT-800 - SU/SD Operation Turbine GT-800 (GRP013)**

**NO<sub>x</sub>**: BACT is the use of Dry Low NO<sub>x</sub> (DLN) combustor technology and good engineering practices on the co-generation units.

**CO**: BACT is good engineering practice and combustion control on the co-generation unit.

**VOC**: BACT is good engineering practice and combustion control on the co-generation unit.

#### **CT-1 - Cooling Tower (EQT010)**

**PM<sub>10</sub>**: BACT is the use of mechanical or induced draft fans with drift eliminators designed to achieve a drift rate of 0.005%, and good operating practices, as determined in PSD-LA-659(M-1). Maximum PM<sub>10</sub> emissions are limited to 1.40 lb/hr.

**Normal Operation: GT-500 – Combustion Gas Turbine (EQT006)**

**Normal Operation: GT-600 – Combustion Gas Turbine (EQT007)**

**Normal Operation: GT-700 – Combustion Gas Turbine (EQT008)**

**Normal Operation: GT-800 – Combustion Gas Turbine (EQT009)**

**PM<sub>10</sub>**: BACT is the use of clean burning fuels (i.e., pipeline quality natural gas, plant produced fuel gas and hydrogen) and good combustion practices, as determined in PSD-LA-659(M-1).

**SO<sub>2</sub>**: BACT is the use of low sulfur fuels with a maximum sulfur content of 5 grains/100 standard cubic feet (SCF) input.

**NO<sub>x</sub>**: BACT is the use of Dry Low NO<sub>x</sub> (DLN) combustor technology with Selective Catalytic Reduction (SCR) and good engineering practices.

**CO**: Good design and operating practices, natural gas as fuel with DLN burners, are the appropriate BACT control technologies, good engineering practice and combustion control as determined in PSD-LA-659(M-1).

**DB-500 - HRSG Duct Burner (EQT012)**

**DB-600 - HRSG Duct Burner (EQT013)**

**DB-700 - HRSG Duct Burner (EQT014)**

**DB-800 - HRSG Duct Burner (EQT015)**

## BRIEFING SHEET

### PLAQUEMINE COGENERATION PLANT AGENCY INTEREST NO.: 85652 DOW CHEMICAL CO. PLAQUEMINE, IBERVILLE PARISH, LOUISIANA PSD-LA-659(M-2)

Since these units can not operate separately from the gas turbines, it is not appropriate to evaluate BACT for these units separately from the gas turbines.

**Combined Cycle Operation: GasTurbine GT-500 with HRSG/DB-500 (GRP006)**  
**Combined Cycle Operation: GasTurbine GT-600 with HRSG/DB-600 (GRP007)**  
**Combined Cycle Operation: GasTurbine GT-700 with HRSG/DB-700 (GRP008)**  
**Combined Cycle Operation: GasTurbine GT-800 with HRSG/DB-800 (GRP009)**

**PM<sub>10</sub>:** BACT is the use of clean burning fuels (i.e., pipeline quality natural gas, plant produced fuel gas and hydrogen) to limit PM<sub>10</sub> emissions to 33.5 lbs/hr from combined turbine and HRSG duct burner vent streams using good combustion practices, as determined in PSD-LA-659(M-1).

**SO<sub>2</sub>:** BACT is the use of low sulfur fuels with a maximum sulfur content of 5 grains/100 standard cubic feet (SCF) input. Maximum SO<sub>2</sub> emissions are limited to 3.3 parts per million by volume (ppmv).

**NO<sub>x</sub>:** BACT is the use of Dry Low NO<sub>x</sub> (DLN) combustor technology in the turbines and Selective Catalytic Reduction (SCR) add-on controls to limit emissions to 5 parts per million on a dry volume basis corrected to 15% oxygen (ppmvd @ 15%) on an annual average basis.

**CO:** Good design and operating practices, natural gas as fuel with DLN burners, are the appropriate BACT control technologies, as determined in PSD-LA-659(M-1). Maximum CO emissions are limited to 25 ppmv at 15% oxygen.

Proper design, operating, and maintenance practices are additional components of BACT for all pollutants.

### **AIR QUALITY IMPACT ANALYSIS**

Prevention of Significant Deterioration regulations require an analysis of existing air quality for those pollutants emitted in significant amounts from a proposed facility. The Industrial Source Complex, Short-Term, Version 3 (ISCST3) modeling performed for PSD-LA-659(M-1) is sufficient for this minor modification to the PSD permit. The modeling indicated maximum ground level concentrations of PM<sub>10</sub>, NO<sub>x</sub> and CO are below the preconstruction monitoring exemption levels and the ambient significance levels. No preconstruction monitoring, increment analysis, or refined modeling is required for these pollutants. VOC increases were less than 50 tons per year; therefore no ambient impact analysis was required.



**BRIEFING SHEET**

**PLAQUEMINE COGENERATION PLANT  
 AGENCY INTEREST NO.: 85652  
 DOW CHEMICAL CO.  
 PLAQUEMINE, IBERVILLE PARISH, LOUISIANA  
 PSD-LA-659(M-2)**

Pollutant	Avg. Period	ISCST3 Screen	PSD Significance Level	Preconstruction Level
PM <sub>10</sub>	Annual	0.64 $\mu\text{g}/\text{m}^3$	1 $\mu\text{g}/\text{m}^3$	-
	24-hour	4.37 $\mu\text{g}/\text{m}^3$	5 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$
SO <sub>2</sub>	Annual	0.14 $\mu\text{g}/\text{m}^3$	1 $\mu\text{g}/\text{m}^3$	-
	24-hour	2.19 $\mu\text{g}/\text{m}^3$	5 $\mu\text{g}/\text{m}^3$	13 $\mu\text{g}/\text{m}^3$
	3-hour	11.8 $\mu\text{g}/\text{m}^3$	25 $\mu\text{g}/\text{m}^3$	-
NO <sub>x</sub>	Annual	0.13 $\mu\text{g}/\text{m}^3$	1 $\mu\text{g}/\text{m}^3$	14 $\mu\text{g}/\text{m}^3$
CO	8-hour	27.6 $\mu\text{g}/\text{m}^3$	500 $\mu\text{g}/\text{m}^3$	575 $\mu\text{g}/\text{m}^3$
	1-hour	111.9 $\mu\text{g}/\text{m}^3$	2000 $\mu\text{g}/\text{m}^3$	-

**ADDITIONAL IMPACTS**

Soils, vegetation, and visibility will not be adversely impacted by the proposed facility, nor will any Class I area be affected. The project will not result in any significant secondary growth effects. Approximately 0 new permanent jobs will be created.

**PROCESSING TIME**

Application Dated:	August 18, 2006
Application Received:	August 21, 2006
Additional Information Dated:	May 11, 2007, June 15, 2007, and November 29, 2007
Effective Completeness Date:	February 11, 2008

**PUBLIC NOTICE**

A notice requesting public comment on the proposed project was published in *The Advocate*, Baton Rouge, Louisiana, on <<Date>>, 200x; and in <<Local Paper>>, <<City>>, Louisiana, on <<Date>>, 200x. Copies of the public notice were also mailed to individuals who have requested to be placed on the mailing list maintained by the Office of Environmental Services on <<Date>>, 200x. A proposed permit was also submitted to U.S. EPA Region VI on <<Date>>, 200x. All comments will be considered prior to a final permit decision.

**PRELIMINARY DETERMINATION SUMMARY**  
**PLAQUEMINE COGENERATION PLANT**  
**AGENCY INTEREST NO.: 85652**  
**DOW CHEMICAL CO.**  
**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**  
**PSD-LA-659(M-2)**  
**February 11, 2008**

**I. APPLICANT**

Dow Chemical Co.  
PO Box 150  
c/o Bldg 3502  
Plaquemine, LA 70765-0150

**II. LOCATION**

The Plaquemine Cogeneration Plant is located at 21255 Hwy 1, Gate 1 within Dow Chemical Co. (a portion of), Plaquemine, Louisiana. Approximate UTM coordinates are 669.879 kilometers East, 3353.371 kilometers North, zone 15.

**III. PROJECT DESCRIPTION**

This permit modification incorporates start-up/shut-down emissions from the power plant into this PSD permit. Start-up operations are defined as the time the unit starts combusting fuel until the turbines reach normal operational mode. The gas valves open to the vent stack when the reference temperature on the combustion turbine reaches a set temperature. The Continuous Emission Monitor System (CEMS) has a signal for when the unit reaches the normal operational set temperature. Shut-down is the reverse of Start-up, when the unit transfers out normal operational mode until no more fuel is combusted. Because the The Dow Chemical Company's Plaquemine Cogeneration Plant uses natural gas to fuel the turbines, only Nitrogen Oxides (NO<sub>x</sub>), Carbon Monoxide (CO), and Volatile Organic Compounds (VOCs) are the pollutants of concern.

The Plaquemine Cogeneration Plant is comprised of four natural gas fired GE Frame 7 FA gas turbines, each with a nominal power rating of 170 MW. The turbines are equipped with dry low NO<sub>x</sub> combustors capable of achieving a NO<sub>x</sub> concentration of 9 parts per million on a dry volume basis, corrected to 15 percent oxygen (ppmvd @ 15% O<sub>2</sub>) during non-peaking operations. Each turbine is also equipped with steam injection capabilities to boost power for peaking purposes.

Each gas turbine is equipped with a heat recovery steam generator (HRSG) and a supplementary-fired duct burner system. The duct burners are capable of firing pure natural gas, plant produced fuel gas provided by the host facility (composed of up to 60% hydrogen with a balance of methane), and/or a pure hydrogen stream provided by the host facility.

## **PRELIMINARY DETERMINATION SUMMARY**

### **PLAQUEMINE COGENERATION PLANT**

**AGENCY INTEREST NO.: 85652**

**DOW CHEMICAL CO.**

**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**

**PSD-LA-659(M-2)**

**February 11, 2008**

Each combined gas turbine/duct burner is outfitted with a selective catalytic reduction (SCR) system capable of achieving a NO<sub>x</sub> concentration of 5 ppmvd @ 15% O<sub>2</sub> on an annual average basis.

Due to mechanical considerations associated with firing pure hydrogen, each duct burner system is equipped with two sets of burners. One set will exclusively fire the pure hydrogen fuel stream, and the second will fire plant produced fuel gas, natural gas, or a blend of plant produced fuel gas and natural gas. The plant produced fuel gas and natural gas fuels will be fed to the duct burners in a common header system. Air augmentation of duct burners may be used during steam injection operating mode to insure stable combustion in the high moisture gas stream. Steam from the HRSGs is either supplied to the host or used to power a steam turbine generator. This generator has a nominal power rating of 200 MW.

A substantial technological limitation exists with respect to limiting start-up / shut-down emissions for combined cycle generating units. Start-up event duration is limited by the time required to adequately warm the heat recovery steam generator (HRSG), associated steam-handling systems and the steam turbine without imparting harmful thermal stresses to this equipment. As the combustion turbine begins operation, the exhaust gases which pass through the HRSG warm the water filled tubes, which begins the process of creating steam which drives the steam turbine.

Although the process of creating steam can begin relatively quickly, an abrupt introduction of steam to the steam turbine can result in uneven expansion of components. This uneven expansion of components can have severe adverse effects on its ability to operate, as well as creating a significant safety hazard. In general, the more time a combined cycle generating unit has been off-line, the more time is required to properly warm the steam cycle.

There are two types of start-up events depending on the length of time that the turbine is off-line between operational events. A cold start is associated with the turbine being off-line for a duration in which the turbine reaches ambient temperature, while a warm start occurs when a unit is down for less time than it takes the turbine to reach ambient temperatures.

Emission maximum lb/hr rate increases for NO<sub>x</sub>, CO, and VOC are due to including the start-up/ shut-down emissions of the four turbines, EQT006, Combustion Gas Turbine GT-500, EQT007, Combustion Gas Turbine GT-600, EQT008, Combustion Gas Turbine GT-700, and EQT009, Combustion Gas Turbine GT-800. These emissions have existed at the site since initial start-up. The emission increases are not due to the installation or modification of any new equipment at the site.

Because the HRSGs are not fired until the turbines reach normal operation, the annual start-up/shut-down emissions are included on GRP006, SU/SD Operation Turbine GT-500, GRP007, SU/SD Operation Turbine GT-600, GRP008, SU/SD Operation Turbine GT-700, and GRP009, SU/SD Operation Turbine GT-800. Plaquemine Cogeneration Plant will demonstrate compliance with the permit limits for GRP005 through GRP009 by following the monitoring, recordkeeping, and reporting requirements.

## PRELIMINARY DETERMINATION SUMMARY

### PLAQUEMINE COGENERATION PLANT AGENCY INTEREST NO.: 85652 DOW CHEMICAL CO. PLAQUEMINE, IBERVILLE PARISH, LOUISIANA PSD-LA-659(M-2) February 11, 2008

Ancillary equipment at the plant will include an 18-ton pressurized anhydrous ammonia storage vessel and a cooling tower that will primarily service the steam turbine generator. The Air Permits Division has reviewed BACT for the cooling tower and found that the combination of drift eliminators designed to achieve a drift rate of 0.005% and good operating practices remain appropriate.

Estimated emissions, in tons per year, are as follows:

<u>Pollutant</u>	<u>Emissions</u>	<u>PSD de minimis</u>	<u>Review required?</u>
PM	559.40	25	No
PM <sub>10</sub>	559.40	15	No
SO <sub>2</sub>	214.80	40	No
NO <sub>x</sub>	854.40	40	No
CO	2503.20	100	No
VOC	43.00	40	No
Formaldehyde	5.80	-	No
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	2.00	-	No
Ammonia (NH <sub>3</sub> , as slip)	631.50	-	No

<u>Pollutant</u>	<u>Baseline Actual Emissions</u>	<u>Projected Actual Emissions/PTE</u>	<u>Contemporaneous Changes</u>	<u>Net Emissions Increase</u>	<u>PSD de minimis</u>	<u>Review required?</u>
PM	559.40	559.40	-	-	25	No
PM <sub>10</sub>	559.40	559.40	-	-	15	No
SO <sub>2</sub>	214.80	214.80	-	-	40	No
NO <sub>x</sub>	854.40	854.40	-	-	40	No
CO	2503.20	2503.20	-	-	100	No
VOC	43.00	48.16	-	5.16	40	No
Formaldehyde	5.80	5.80	-	-	-	No
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	2.00	2.00	-	-	7	No
Ammonia (NH <sub>3</sub> , as slip)	631.50	631.50	-	-	-	No

#### IV. SOURCE IMPACT ANALYSIS

A proposed net increase in the emission rate of a regulated pollutant above de minimis levels for new major or modified major stationary sources requires review under Prevention of

**PRELIMINARY DETERMINATION SUMMARY**

**PLAQUEMINE COGENERATION PLANT**  
**AGENCY INTEREST NO.: 85652**  
**DOW CHEMICAL CO.**  
**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**  
**PSD-LA-659(M-2)**  
**February 11, 2008**

Significant Deterioration regulations, 40 CFR 52.21. PSD review entails the following analyses:

- A. A determination of the Best Available Control Technology (BACT);
- B. An analysis of the existing air quality and a determination of whether or not preconstruction or post-construction monitoring will be required;
- C. An analysis of the source's impact on total air quality to ensure compliance with the National Ambient Air Quality Standards (NAAQS);
- D. An analysis of the PSD increment consumption;
- E. An analysis of the source related growth impacts;
- F. An analysis of source related growth impacts on soils, vegetation, and visibility;
- G. A Class I Area impact analysis; and
- H. An analysis of the impact of toxic compound emissions.

**A. BEST AVAILABLE CONTROL TECHNOLOGY**

Under current PSD regulations, an analysis of "top down" BACT is required for the control of each regulated pollutant emitted from a new major source in excess of the specified significant emission rates. The top down approach to the BACT process involves determining the most stringent control technique available for a similar or identical source. If it can be shown that this level of control is infeasible based on technical, environmental, energy, and/or cost considerations, then it is rejected and the next most stringent level of control is determined and similarly evaluated. This process continues until a control level is arrived at which cannot be eliminated for any technical, environmental, or economic reason. A technically feasible control strategy is one that has been demonstrated to function efficiently on identical or similar processes. Additionally, BACT shall not result in emissions of any pollutant which would exceed any applicable standard under 40 CFR Parts 60 and 61.

For this project, BACT analyses are required for PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and CO emissions from both the cogeneration unit turbines and duct burners. Additionally, a BACT analysis is required for PM<sub>10</sub> emissions from the cooling tower. Where PM<sub>10</sub> is addressed in the BACT analysis, it is assumed that particulate matter (PM) is also being considered.

The BACT analyses address the gas turbines, and in the case of the analysis for PM/PM<sub>10</sub> emissions, the gas turbines and the cooling tower. Exit gas from the turbines will be routed to duct burners, where additional fuel will be burned and the heat recovered in the heat recovery

## PRELIMINARY DETERMINATION SUMMARY

### PLAQUEMINE COGENERATION PLANT AGENCY INTEREST NO.: 85652 DOW CHEMICAL CO. PLAQUEMINE, IBERVILLE PARISH, LOUISIANA PSD-LA-659(M-2) February 11, 2008

steam generators. Potential controls for PM/PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and CO emissions from the duct burners are the same as those discussed for the combustion turbines. Because the exhaust gas streams from the turbines and duct burners will be combined prior to entering a control device, and due to the similarities in the streams, the assessment of technical and economic feasibility of each control method does not differ.

#### **BACT analyses for PM/PM<sub>10</sub>**

##### **Combustion Turbines/Duct Burners**

**EQT Nos.: 006, 007, 008, 009, 012, 013, 014, 015**

BACT for PM<sub>10</sub> as determined in Permit Nos. PSD-LA-659 and PSD-LA-659(M-1) is the use of clean burning fuels (i.e., pipeline quality natural gas, plant produced fuel gas, and hydrogen) to limit particulate emissions from the combined gas turbine and duct burner vent streams to 33.5 lb/hr. This is also determined in Permit No. PSD-LA-659(M-2) to be BACT during periods of startup and shutdown.

##### **Cooling Tower**

**EQT No.: 010**

BACT for PM<sub>10</sub> emissions as determined in Permit Nos. PSD-LA-659 and PSD-LA-659(M-1) is drift eliminators designed to achieve a drift rate of 0.005%, as well as good operating practices.

#### **BACT analyses for SO<sub>2</sub>**

##### **Combustion Turbines/Duct Burners**

**EQT Nos.: 006, 007, 008, 009, 012, 013, 014, 015**

BACT for SO<sub>2</sub> emissions as determined in Permit Nos. PSD-LA-659 and PSD-LA-659(M-1) is the use of clean burning fuels with a maximum sulfur content of 5 grains/100 scf. This is also determined in Permit No. PSD-LA-659(M-2) to be BACT during periods of startup and shutdown.

#### **BACT analyses for NO<sub>x</sub>**

##### **Combustion Turbines/Duct Burners**

**EQT Nos.: 006, 007, 008, 009, 012, 013, 014, 015**

BACT for NO<sub>x</sub> emissions as determined in Permit Nos. PSD-LA-659 and PSD-LA-659(M-1) is the combination of dry low NO<sub>x</sub> burners and selective catalytic reduction add-on controls which limits NO<sub>x</sub> emissions to 5 ppmvd @ 15% O<sub>2</sub> on an annual average basis. This is also determined in Permit No. PSD-LA-659(M-2) to be BACT during periods of startup and shutdown.

**PRELIMINARY DETERMINATION SUMMARY**

**PLAQUEMINE COGENERATION PLANT**  
**AGENCY INTEREST NO.: 85652**  
**DOW CHEMICAL CO.**  
**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**  
**PSD-LA-659(M-2)**  
**February 11, 2008**

**BACT analyses for CO**

**Combustion Turbines/Duct Burners**

**EQT Nos.: 006, 007, 008, 009, 012, 013, 014, 015**

BACT for CO emissions as determined in Permit Nos. PSD-LA-659 and PSD-LA-659(M-1) is good combustion practices that limit such emissions from the combined flue gases to 25 ppmvd @ 15% O<sub>2</sub>. This is also determined in Permit No. PSD-LA-659(M-2) to be BACT during periods of startup and shutdown.

**B. ANALYSIS OF EXISTING AIR QUALITY**

Prevention of Significant Deterioration regulations require an analysis of existing air quality for those pollutants to be emitted in significant amounts from a proposed facility. PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, and CO are pollutants of concern in this case.

ISCST3 modeling of PM<sub>10</sub>, NO<sub>x</sub>, and CO emissions from the proposed project indicates that the maximum offsite ground level concentrations of these pollutants will be below their respective PSD significance levels and preconstruction monitoring levels. Therefore, preconstruction monitoring, refined NAAQS modeling, and increment consumption analyses were not required.

However, the model predicted that SO<sub>2</sub> emissions would exceed the significance level, but not the preconstruction monitoring level, for the 3-hour and 24-hour averaging period; consequently, refined NAAQS modeling and increment consumption analyses were required, but preconstruction monitoring was not.

VOC emissions from the proposed station will be less than 100 tons per year. An ambient air quality analysis for ozone and preconstruction monitoring are not required.

Pollutant	Averaging Period	ISCST3 Screen	PSD Significance Level	Preconstr. Level
PM <sub>10</sub>	Annual	0.64 µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	-
	24-hour	4.37 µg/m <sup>3</sup>	5 µg/m <sup>3</sup>	10 µg/m <sup>3</sup>
SO <sub>2</sub>	Annual	0.14 µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	-
	24-hour	2.19 µg/m <sup>3</sup>	5 µg/m <sup>3</sup>	13 µg/m <sup>3</sup>
	3-hour	11.8 µg/m <sup>3</sup>	25 µg/m <sup>3</sup>	-
NO <sub>x</sub>	Annual	0.13 µg/m <sup>3</sup>	1 µg/m <sup>3</sup>	14 µg/m <sup>3</sup>

## PRELIMINARY DETERMINATION SUMMARY

### PLAQUEMINE COGENERATION PLANT AGENCY INTEREST NO.: 85652 DOW CHEMICAL CO. PLAQUEMINE, IBERVILLE PARISH, LOUISIANA PSD-LA-659(M-2) February 11, 2008

CO	8-hour	27.6 $\mu\text{g}/\text{m}^3$	500 $\mu\text{g}/\text{m}^3$	575 $\mu\text{g}/\text{m}^3$
	1-hour	111.9 $\mu\text{g}/\text{m}^3$	2000 $\mu\text{g}/\text{m}^3$	-

#### C. NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) ANALYSIS

Because ISCST3 modeling analyses indicated concentrations of each pollutant would be below its PSD ambient significance level, refined NAAQS modeling was not required.

#### D. PSD INCREMENT ANALYSIS

Because ISCST3 modeling analyses indicated concentrations of each pollutant would be below its PSD ambient significance level, PSD increment modeling was not required.

#### E. SOURCE RELATED GROWTH IMPACTS

Operation of this facility is not expected to have any significant effect on residential growth or industrial/commercial development in the area of the facility. No significant net change in employment, population, or housing will be associated with the project. As a result, there will not be any significant increases in pollutant emissions indirectly associated with Dow Chemical Co's proposal. Secondary growth effects will include temporary construction related jobs and approximately 0 permanent jobs.

#### F. SOILS, VEGETATION, AND VISIBILITY IMPACTS

There will be no significant impact on area soils, vegetation, or visibility.

#### G. CLASS I AREA IMPACTS

Louisiana's Breton Wildlife Refuge the nearest Class I area, is over 100 kilometers from the site, precluding any significant impact.

#### H. TOXIC EMISSIONS IMPACT

The selection of control technology based on the BACT analysis included consideration of control of toxic emissions.

The Plaquemine Cogeneration Plant will emit formaldehyde as a result of the combustion of natural gas, ammonia from the operation of the SCR system, and sulfuric acid. Per §5105.B.2, electric utility steam-generating units (duct burners) are not regulated under Subchapter A of LAC 33:III.Chapter 51. Emissions from the combustion of Group 1 virgin



**PRELIMINARY DETERMINATION SUMMARY**

**PLAQUEMINE COGENERATION PLANT**

**AGENCY INTEREST NO.: 85652**

**DOW CHEMICAL CO.**

**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**

**PSD-LA-659(M-2)**

**February 11, 2008**

fossil fuels are exempt from the requirements of Subchapter A per §5105.B.3.a. Ammonia emissions from the SCR system and sulfuric acid emissions from the turbines will be regulated under Chapter 51.

**V. CONCLUSION**

The Air Permits Division has made a preliminary determination to approve modification to include start-up / shut-down emissions at the at the The Dow Chemical Co - Plaquemine Cogeneration Plant near Plaquemine, in Iberville Parish, Louisiana, subject to the attached specific and general conditions. In the event of a discrepancy in the provisions found in the application and those in this Preliminary Determination Summary, the Preliminary Determination Summary shall prevail.

## SPECIFIC CONDITIONS

### PLAQUEMINE COGENERATION PLANT AGENCY INTEREST NO.: 85652 DOW CHEMICAL CO. PLAQUEMINE, IBERVILLE PARISH, LOUISIANA PSD-LA-659(M-2)

- The permittee is authorized to operate in conformity with the specifications submitted to the Louisiana Department of Environmental Quality (LDEQ) as analyzed in LDEQ's document entitled "Preliminary Determination Summary" dated August 27, 2007, and subject to the following emissions limitations and other specified conditions. Specifications submitted are contained in the application and Emission Inventory Questionnaire dated June 6, 2006, and additional information dated August 21, 2006, May 11, 2007, August 23, 2007, and November 29, 2007. The modified permit is based on the information received as additional information received May 11, 2007, June 15, 2007, and November 29, 2007.

### MAXIMUM ALLOWABLE EMISSIONS RATES

ID No.	Description		PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
GT-500	Gas Turbine/Duct Burner	ppmv	-	3.3	5	25
GT-600	Gas Turbine/Duct Burner	lb/hr	38.1	40.7	*240.00	212.5
GT-700	Gas Turbine/Duct Burner		-	-	**480.00	-
GT-800	Gas Turbine/Duct Burner (2876 MM BTU/hr each)	TPY	139.0	53.7	213.6	625.8
CT-1	Cooling Tower	lb/hr	1.4	-	-	-
		TPY	3.4			

\*This emission rate is applicable only during normal operations

\*\*This emission rate is applicable only during start up or shut down of the unit.

- Permittee shall ensure compliance with the opacity and particulate emission limits of this permit by visually inspecting the Combustion Gas Turbines-HRSG Trains with Duct Burners stacks, Emission Points GT-500, GT-600, GT-700, and GT-800, DB-500 for opacity on a weekly basis. If visible emissions are detected, then, within three (3) working days, the permittee shall conduct a six-minute opacity reading in accordance with EPA Reference Method 9. Records of visible emission checks shall include the emission point ID number, the date the visual check was performed, a record if visible emissions were detected, and a record and results of any Method 9 testing conducted. These records shall be kept on site and available for inspection by the Office of Environmental Compliance, Surveillance Division.
- Permittee shall monitor and record continuous emissions monitoring system (CEMS) data in accordance with the terms and conditions of this permit that shows the emissions of nitrogen oxides during normal operations (i.e., during periods that are not classified as start up or shut down) of Gas Turbines (Source ID Nos. GT-500, GT-600, GT-700, and GT-800) for a period of twelve (12) consecutive months. After that time, permittee shall apply to LDEQ for a permit modification so that LDEQ may reevaluate BACT for nitrogen oxides. Permittee shall supply a copy of this CEMS data to LDEQ as part of the application for a permit modification.

## LOUISIANA AIR EMISSION PERMIT GENERAL CONDITIONS

- I. This permit is issued on the basis of the emissions reported in the application for approval of emissions and in no way guarantees that the design scheme presented will be capable of controlling the emissions to the type and quantities stated. Failure to install, properly operate and/or maintain all proposed control measures and/or equipment as specified in the application and supplemental information shall be considered a violation of the permit and LAC 33:III.501. If the emissions are determined to be greater than those allowed by the permit (e.g. during the shakedown period for new or modified equipment) or if proposed control measures and/or equipment are not installed or do not perform according to design efficiency, an application to modify the permit must be submitted. All terms and conditions of this permit shall remain in effect unless and until revised by the permitting authority.
  
- II. The permittee is subject to all applicable provisions of the Louisiana Air Quality Regulations. Violation of the terms and conditions of the permit constitutes a violation of these regulations.
  
- III. The Emission Rates for Criteria Pollutants, Emission Rates for TAP/HAP & Other Pollutants, and Specific Requirements sections or, where included, Emission Inventory Questionnaire sheets establish the emission limitations and are a part of the permit. Any operating limitations are noted in the Specific Requirements or, where included, Tables 2 and 3 of the permit. The synopsis is based on the application and Emission Inventory Questionnaire dated September 7, 2006, along with supplemental information dated May 11, 2007.
  
- IV. This permit shall become invalid, for the sources not constructed, if:
  - A. Construction is not commenced, or binding agreements or contractual obligations to undertake a program of construction of the project are not entered into, within two (2) years (18 months for PSD permits) after issuance of this permit, or;
  - B. If construction is discontinued for a period of two (2) years (18 months for PSD permits) or more.

The administrative authority may extend this time period upon a satisfactory showing that an extension is justified.

This provision does not apply to the time period between construction of the approved phases of a phased construction project. However, each phase must commence construction within two (2) years (18 months for PSD permits) of its projected and approved commencement date.
  
- V. The permittee shall submit semiannual reports of progress outlining the status of construction, noting any design changes, modifications or alterations in the construction schedule which have or may have an effect on the emission rates or ambient air quality levels. These reports shall continue to be submitted until such time as construction is certified as being complete. Furthermore, for any significant change in the design, prior approval shall be obtained from the Office of Environmental Services, Air Permits Division.
  
- VI. The permittee shall notify the Department of Environmental Quality, Office of Environmental Services, Air Permits Division within ten (10) calendar days from the date that construction is certified as complete and the estimated date of start-up of operation. The appropriate Regional Office shall also be so notified within the same time frame.
  
- VII. Any emissions testing performed for purposes of demonstrating compliance with the limitations set forth in paragraph III shall be conducted in accordance with the methods described in the Specific Conditions and, where included, Tables 1, 2, 3, 4, and 5 of this permit. Any deviation from or modification of the methods used for testing shall have prior approval from the Office of

## LOUISIANA AIR EMISSION PERMIT GENERAL CONDITIONS

Environmental Assessment, Air Quality Assessment Division.

- VIII. The emission testing described in paragraph VII above, or established in the specific conditions of this permit, shall be conducted within sixty (60) days after achieving normal production rate or after the end of the shakedown period, but in no event later than 180 days after initial start-up (or restart-up after modification). The Office of Environmental Assessment, Air Quality Assessment Division shall be notified at least (30) days prior to testing and shall be given the opportunity to conduct a pretest meeting and observe the emission testing. The test results shall be submitted to the Air Quality Assessment Division within sixty (60) days after the complete testing. As required by LAC 33:III.913, the permittee shall provide necessary sampling ports in stacks or ducts and such other safe and proper sampling and testing facilities for proper determination of the emission limits.
- IX. The permittee shall, within 180 days after start-up and shakedown of each project or unit, report to the Office of Environmental Compliance, Enforcement Division any significant difference in operating emission rates as compared to those limitations specified in paragraph III. This report shall also include, but not be limited to, malfunctions and upsets. A permit modification shall be submitted, if necessary, as required in Condition I.
- X. The permittee shall retain records of all information resulting from monitoring activities and information indicating operating parameters as specified in the specific conditions of this permit for a minimum of at least five (5) years.
- XI. If for any reason the permittee does not comply with, or will not be able to comply with, the emission limitations specified in this permit, the permittee shall provide the Office of Environmental Compliance, Enforcement Division with a written report as specified below.
- A. A written report shall be submitted within 7 days of any emission in excess of permit requirements by an amount greater than the Reportable Quantity established for that pollutant in LAC 33.I.Chapter 39.
  - B. A written report shall be submitted within 7 days of the initial occurrence of any emission in excess of permit requirements, regardless of the amount, where such emission occurs over a period of seven days or longer.
  - C. A written report shall be submitted quarterly to address all emission limitation exceedances not included in paragraphs A or B above. The schedule for submittal of quarterly reports shall be no later than the dates specified below for any emission limitation exceedances occurring during the corresponding specified calendar quarter:
    - 1. Report by June 30 to cover January through March
    - 2. Report by September 30 to cover April through June
    - 3. Report by December 31 to cover July through September
    - 4. Report by March 31 to cover October through December
  - D. Each report submitted in accordance with this condition shall contain the following information:
    - 1. Description of noncomplying emission(s);
    - 2. Cause of noncompliance;
    - 3. Anticipated time the noncompliance is expected to continue, or if corrected, the duration of the period of noncompliance;
    - 4. Steps taken by the permittee to reduce and eliminate the noncomplying emissions;

## LOUISIANA AIR EMISSION PERMIT GENERAL CONDITIONS

- and
5. Steps taken by the permittee to prevent recurrences of the noncomplying emissions.
- E. Any written report submitted in advance of the timeframes specified above, in accordance with an applicable regulation, may serve to meet the reporting requirements of this condition provided all information specified above is included. For Part 70 sources, reports submitted in accordance with Part 70 General Condition R shall serve to meet the requirements of this condition provided all specified information is included. Reporting under this condition does not relieve the permittee from the reporting requirements of any applicable regulation, including LAC 33.I.Chapter 39, LAC 33.III.Chapter 9, and LAC 33.III.5107.
- XII. Permittee shall allow the authorized officers and employees of the Department of Environmental Quality, at all reasonable times and upon presentation of identification, to:
- A. Enter upon the permittee's premises where regulated facilities are located, regulated activities are conducted or where records required under this permit are kept;
  - B. Have access to and copy any records that are required to be kept under the terms and conditions of this permit, the Louisiana Air Quality Regulations, or the Act;
  - C. Inspect any facilities, equipment (including monitoring methods and an operation and maintenance inspection), or operations regulated under this permit; and
  - D. Sample or monitor, for the purpose of assuring compliance with this permit or as otherwise authorized by the Act or regulations adopted thereunder, any substances or parameters at any location.
- XIII. If samples are taken under Section XII.D. above, the officer or employee obtaining such samples shall give the owner, operator or agent in charge a receipt describing the sample obtained. If requested prior to leaving the premises, a portion of each sample equal in volume or weight to the portion retained shall be given to the owner, operator or agent in charge. If an analysis is made of such samples, a copy of the analysis shall be furnished promptly to the owner, operator or agency in charge.
- XIV. The permittee shall allow authorized officers and employees of the Department of Environmental Quality, upon presentation of identification, to enter upon the permittee's premises to investigate potential or alleged violations of the Act or the rules and regulations adopted thereunder. In such investigations, the permittee shall be notified at the time entrance is requested of the nature of the suspected violation. Inspections under this subsection shall be limited to the aspects of alleged violations. However, this shall not in any way preclude prosecution of all violations found.
- XV. The permittee shall comply with the reporting requirements specified under LAC 33:III.919 as well as notification requirements specified under LAC 33:III.927.
- XVI. In the event of any change in ownership of the source described in this permit, the permittee and the succeeding owner shall notify the Office of Environmental Services, Air Permits Division, within ninety (90) days after the event, to amend this permit.
- XVII. Very small emissions to the air resulting from routine operations, that are predictable, expected, periodic, and quantifiable and that are submitted by the permitted facility and approved by the Air Permits Division are considered authorized discharges. Approved activities are noted in the General Condition XVII Activities List of this permit. To be approved as an authorized discharge,

## LOUISIANA AIR EMISSION PERMIT GENERAL CONDITIONS

these very small releases must:

1. Generally be less than 5 TPY
2. Be less than the minimum emission rate (MER)
3. Be scheduled daily, weekly, monthly, etc., or
4. Be necessary prior to plant startup or after shutdown [line or compressor pressuring/depressuring for example]

These releases are not included in the permit totals because they are small and will have an insignificant impact on air quality. This general condition does not authorize the maintenance of a nuisance, or a danger to public health and safety. The permitted facility must comply with all applicable requirements, including release reporting under LAC 33:I.3901.

- XVIII. Provisions of this permit may be appealed in writing pursuant to La. R.S. 30:2024(A) within 30 days from receipt of the permit. Only those provisions specifically appealed will be suspended by a request for hearing, unless the secretary or the assistant secretary elects to suspend other provisions as well. Construction cannot proceed except as specifically approved by the secretary or assistant secretary. A request for hearing must be sent to the following:

Attention: Office of the Secretary, Legal Services Division  
La. Dept. of Environmental Quality  
Post Office Box 4302  
Baton Rouge, Louisiana 70821-4302

- XIX. Certain Part 70 general conditions may duplicate or conflict with state general conditions. To the extent that any Part 70 conditions conflict with state general conditions, then the Part 70 general conditions control. To the extent that any Part 70 general conditions duplicate any state general conditions, then such state and Part 70 provisions will be enforced as if there is only one condition rather than two conditions.

**TABLE I: BACT COST SUMMARY**

**PLAQUEMINE COGENERATION PLANT**  
**AGENCY INTEREST NO.: 85652**  
**DOW CHEMICAL CO.**  
**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**  
**PSD-LA-659(M-2)**

Control Alternatives	Availability/ Feasibility	Negative Impacts (a)	Control Efficiency	Emissions Reduction (TPY)(b)	Capital Cost (\$)	Annualized Cost (\$)	Cost Effectiveness (\$/ton)	Notes
PM/PM <sub>10</sub>	Yes/Yes	-	-	-	-	-	-	Selected
SO <sub>2</sub>	Yes/Yes	-	-	-	-	-	-	Selected
NO <sub>x</sub>	Yes/No	1	87% (2 ppmvd)	586.8 <sup>1</sup>	\$25,077,360	\$5,453,995	\$9294 <sup>2</sup>	
NO <sub>x</sub>	Yes/Yes	-	-	-	-	-	-	Selected
CO	Yes/No	1	96% (1 ppmvd)	600.8	\$25,077,360	\$5,453,995	\$9078 <sup>2</sup>	
CO	Yes/No	2,3	-	-	-	-	-	
CO	Yes/Yes	-	-	-	-	-	-	Selected
<b>Notes:</b> a) Negative impacts: 1) economic, 2) environmental, 3) energy, 4) safety b) Emission reduction achieved is on a per turbine/duct burner basis. <sup>1</sup> Reduction from uncontrolled state, 15.8 ppmvd. <sup>2</sup> The overall cost effectiveness for SCONOX is \$4592/ton considering that NO <sub>x</sub> and CO reductions are achieved with the same unit.								

TABLE II: AIR QUALITY ANALYSIS SUMMARY

**THE DOW CHEMICAL CO. – PLAQUEMINE COGENERATION PLANT**  
**AGENCY INTEREST NO.: 85652**  
**DOW CHEMICAL CO.**  
**PLAQUEMINE, IBERVILLE PARISH, LOUISIANA**  
**PSD-LA-659(M-2)**

Pollutant	Averaging Period	Preliminary Screening Concentration ( $\mu\text{g}/\text{m}^3$ )	Significant Monitoring Concentration ( $\mu\text{g}/\text{m}^3$ )	Current Monitored Background Concentration ( $\mu\text{g}/\text{m}^3$ )	Level of Significant Impact ( $\mu\text{g}/\text{m}^3$ )	Maximum Modeled Concentration ( $\mu\text{g}/\text{m}^3$ )	Modeled + Background Concentration ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )	Modeled PSD Increment Consumption ( $\mu\text{g}/\text{m}^3$ )	Allowable Class II PSD Increment ( $\mu\text{g}/\text{m}^3$ )
PM <sub>10</sub>	24-hour	4.37	10	NR	5	NR	NR	150	NR	30
	Annual	0.64	-	NR	1	NR	NR	50	NR	17
SO <sub>2</sub>	3-hour	11.8	-	NR	25	NR	NR	1300	NR	512
	24-hour	2.19	13	NR	5	NR	NR	365	NR	91
	Annual	0.14	-	NR	1	NR	NR	80	NR	20
NO <sub>x</sub>	Annual	0.13	14	NR	1	NR	NR	100	NR	25
CO	1-hour	111.9	-	NR	2000	NR	NR	40,000	NR	-
	8-hour	27.6	575	NR	500	NR	NR	10,000	NR	-
NR = Not required										